WHAT IS CLAIMED IS:

1.   A numerical processing apparatus for deciding correspondence from output points in an output space of m dimensions to input points in an input space of n dimensions wherein m is smaller than n, the numerical processing apparatus comprising:

a limited output point group generation unit that generates a limited output point group in the output space corresponding to a limited input point group satisfying a predetermined constraint condition set in the input space in advance; and

an input point element determination unit that determines at least one element of the input point satisfying the constraint condition, when an output point is given, on the basis of the limited input point group and the generated limited output point group.

2.   The numerical processing apparatus according to claim 1, wherein the constraint condition includes a condition in which the correspondence from output points to input points is decided uniquely.

3.   The numerical processing apparatus according to claim 1, wherein the input point element determination unit

determines at least one of n elements of the input points on the basis of the limited output point group and a group of elements to be determined in the limited input point group corresponding to the limited output point group.

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4.   The numerical processing apparatus according to claim 1, further comprising:

an input point determination unit that determines the residual elements of the input points on the basis of the given

10   output point and at least one element of the input points determined by the input point element determination unit.

5.   A color processing apparatus for deciding correspondence from output colors in an output color space of

15   m dimensions to input colors in an input color space of n dimensions wherein m is smaller than n, the color processing apparatus comprising:

a limited output color group generation unit that generates a limited output color group in the output color space

20   corresponding to a limited input color group satisfying a predetermined constraint condition set in the input color space in advance; and

an input color element determination unit that determines at least one element of the input color satisfying the constraint

25   condition, when an output color is given, on the basis the limited

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input color group and the generated limited output color group.

6.   The color processing apparatus according to claim 5, wherein:

the input color space includes an element of black; and

the constraint condition includes a condition of the input colors in which the output colors corresponding to the input colors are distributed on a curved surface corresponding to a value of black, which is the element of the input colors.

7.   The color processing apparatus according to claim 5, wherein:

the input color space includes four elements of cyan, magenta, yellow and black; and

the constraint condition includes a condition that a sum of cyan, magenta, yellow and black takes a value decided in advance.

8.   The color processing apparatus according to claim 5, wherein:

the input color space includes four elements of cyan, magenta, yellow and black; and

the constraint condition includes a condition that at least one of cyan, magenta and yellow takes a maximum value in an allowable range.

9.   The color processing apparatus according to claim 5, wherein:

the input color space includes four elements of cyan, magenta, yellow and black; and

the constraint condition includes a condition that at least one of cyan, magenta and yellow takes a minimum value in an allowable range.

10.   The color processing apparatus according to claim 5, wherein:

the input color space includes four elements of cyan, magenta, yellow and black,

the color processing apparatus further comprising:

an input color determination unit that determines the residual elements of the input colors on the basis of the output color and at least one of the elements of cyan, magenta, yellow and black of the input color determined by the input color element determination unit.

11.   A numerical processing method for deciding correspondence from output points in an output space of m dimensions to input points in an input space of n dimensions, wherein m is smaller than n, the numerical processing method comprising:

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generating a limited output point group in the output space corresponding to a limited input point group satisfying a predetermined constraint condition set in the input space in advance; and

5   determining at least one element of the input point satisfying the constraint condition, when an output point is given, on the basis of the limited input point group and the generated limited output point group.

10   12.   A color processing method for deciding correspondence from output colors in an output color space of m dimensions to input colors in an input color space of n dimensions, wherein m is smaller than n, the color processing method comprising:.

15   generating a limited output color group in the output color space corresponding to a limited input color group satisfying a predetermined constraint condition set in the input color space in advance; and

determining at least one element of the input color
20 satisfying the constraint condition, when an output color is given, on the basis of the limited input color group and the generated limited output color group.

13.   A storage medium capable of being read by a computer
25 and storing a numerical processing program for making a computer

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execute a numerical processing for deciding correspondence from output points in an output space of m dimensions to input points in an input space of n dimensions, wherein m is smaller than n, the numerical processing program comprising:

5   generating a limited output point group in the output space corresponding to a limited input point group satisfying a predetermined constraint condition set in the input space in advance; and

determining at least one element of the input point

10   satisfying the constraint condition, when an output point is given, on the basis of the limited input point group and the generated limited output point group.

14. A storage medium capable of being read by a computer

15   and storing a color processing program for making a computer execute a color processing for deciding correspondence from output colors in an output color space of m dimensions to input colors in an input color space of n dimensions, wherein m is smaller than n, the color processing program comprising:.

20   generating a limited output color group in the output color space corresponding to a limited input color group satisfying a predetermined constraint condition set in the input color space in advance; and

determining at least one element of the input color

25   satisfying the constraint condition, when an output color is

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given, on the basis of the limited input color group and the generated limited output color group.